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The Burden of Moderate/Severe Premenstrual Syndrome and Premenstrual Dysphoric Disorder in a Cohort of Latin American Women

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ABSTRACT

Objectives: The aim of this study was to investigate the relationship between symptom severity, cost, and impairment in women with moderate/severe premenstrual syndrome (PMS) or premenstrual dysphoric disorder (PMDD) in a Latin American setting. **Methods:** A model was constructed based on analysis of an observational dataset. Data were included from four Latin American countries. Responder-level data were analysed according to four categories of symptom severity: Category 1 comprised Daily Record of Severity of Problems score 21 to 41.9, Category 2 score was 42 to 62.9, Category 3 score was 63 to 83.9, and Category 4 was a score of 84 or higher. Burden was estimated in terms of impact on job and activities using the modified work productivity and impairment questionnaire and affect on quality of life using the SF-12 questionnaire. Costs were estimated in Brazilian reals from a Brazilian private health care and societal perspective. The outputs of the analysis were estimates of burden, mean annual cost and affect on quality of life (as measured by quality adjusted life years) by symptom severity. Confidence intervals around key outcomes were generated through nonparametric bootstrapping. **Results:** Analysis suggests a significant cost burden associated with moderate/severe PMS and PMDD with mean per patient annual costs estimated at 1618 BRL (95% confidence interval 957–2,481). Although the relationship between cost, quality of life, and severity was not clear, analysis showed a consistent relationship between disease severity and measures of disease burden (job and daily activity). Burden on activities increased with disease severity. **Conclusions:** Our analysis, conducted from a Latin American perspective, suggests a significant burden and an increasing impairment associated with moderate/severe PMS and PMDD.

Keywords: burden, daily record of severity of problems, premenstrual dysphoric disorder, premenstrual syndrome.

Introduction

Premenstrual dysphoric disorder (PMDD) is a severe form of premenstrual syndrome (PMS). Key features include depressed mood, anxiety, affective liability, persistent anger or irritability, and change in appetite or sleep. By *Diagnostic Statistical Manual*, 4th edition, definition, in women with PMDD symptoms are severe enough to markedly affect usual daily activities. More than 80% of women of reproductive age may experience some emotional and/or physical premenstrual symptoms [1-3] and approximately 3% to 8% of menstruating women have symptoms that are severe enough to meet the specific diagnostic criteria for PMDD [4,5]. Expert review of country-specific data suggests that the prevalence of PMS/PMDD may be higher in Latin American countries than in North American or European cohorts [6].

PMDD and moderate/severe PMS are associated with significant impairment as measured by a number of scales [7,8]. However, there are only a limited number of studies available that attempt to quantify the influence of these impairments [9,10]. To the author's knowledge, no studies have been conducted from a Latin American perspective. In the absence of such data, a comprehensive awareness of the impact of PMDD is lacking. Within Latin America, PMDD is not fully accepted as a discrete disease entity. Providing more evidence on the burden of PMDD is likely to increase the awareness of PMDD and more clearly define the disease.

A multicountry observational study was recently conducted in women to assess the impact of pre-menstrual symptoms (see Box 1 in Supplemental Material found at doi:10.1016/j.jval.2011.05.008). The impact was measured through assessment of direct and indirect outcomes via the modified work productivity and impairment questionnaire (m-WPAI) and the impact on quality of life through use of the SF-12 questionnaire. The study has generated new information about resource use and quality

Conflicts of interest: Bayer HealthCare Pharmaceuticals has commissioned IMS Health HQ Ltd to conduct a model to investigate the relationship between symptom severity, cost, and impairment in women with moderate/severe premenstrual syndrome (PMS) or premenstrual dysphoric disorder (PMDD) in a Latin American setting. The preparation of the work and the development of this manuscript was based on the results of the model development which was conducted as a collaboration between IMS Health HQ Ltd, Jean Endicott as external expert, and Bayer Health Economics and Outcomes Research team, i.e. by the authors listed.

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of life among women with PMS [11]. This article reports an analysis of these data designed to quantify the burden associated with PMDD and moderate/severe PMS in women from a Latin American subset of the dataset.

Methods

The aim of our study was to investigate the relationship between symptoms, burden, and impairment in women with moderate/severe PMS or PMDD, based on the findings of a multicenter observational study (the IMPACT study) and assignment of country-specific cost data. The IMPACT study [11] reported symptom severity, measured by the Daily Record of Severity of Problems (DRSP) form, alongside impairment measured by a modified WPAI scale, resource use, productivity, and quality of life. The DRSP is an accepted measure of the severity of symptoms and impairment at various phases of the menstrual cycle [12] (see Box 2 in Supplemental Materials found at; doi:10.1016/j.jval.2011.05.008). The WPAI is a validated scale for measurement of the effects of disease on daily living activities and includes assessment of affect on productivity. Versions of the scale have been validated in a Latin American setting [13]. The original WPAI was modified to include additional questions related to resource use.

In our analysis, impairment (as measured by the m-WPAI), annual direct and indirect costs (estimated from reported resource use and lost productivity), and quality-adjusted life years (QALYs) (estimated from reported quality of life) were estimated according to symptom severity for a subset of women included in the observational study. The observational study was pan-global with data collected from women in 19 countries. Our analysis focused on Latin America, and was limited to consideration of a subset of the cohort of women from the four Latin American countries included in the observational study (Brazil, Venezuela, Colombia, and Mexico). We additionally considered only those women experiencing moderate/severe PMS or PMDD. Data were pooled to increase the power of the analysis and retain the statistical integrity of the dataset. We explored the health statistics of the four included countries to determine if they constituted an economically similar group suitable for pooled analysis [14]. The aim was to develop a dataset that might serve as a proxy for individual country analyses in a Latin American setting.

The country perspective selected was that of Brazil and the cost analysis was conducted from a Brazilian perspective. A societal perspective based on private health care costs was chosen. The Brazilian health care system is a two-tier system with a national health system (Sistema Único de Saúde) as well as a supplementary private medical system funded by private funds or through work insurance schemes. The burden of disease calculated is most relevant to those women who used the private system in that these women would be most likely to seek treatment for PMDD. We therefore analyzed the burden of moderate to severe PMS and PMDD from a private health perspective, including the costs to the government from lost productivity.

Severity was defined by DRSP total luteal score, and costs and QALYs were reported by the defined categories of severity. The approach to categorization followed previously reported analyses [15]. Five severity categories were initially defined on the basis of previous analysis. Initial review of the data indicated very limited numbers in the top two severity categories; these categories were therefore combined to improve the sample size of the analysis. The reported analyses are based on four categories: Category 1 comprised women with DRSP scores 21 to 41.9, Category 2 was made up of women with scores 42 to 62.9, Category 3 was made up of women with scores of 63 to 83.9, Category 4 included women with scores of 84 or more. Category 1 includes those women with minimal symptoms; Category 4 includes women at the most severe end of the symptom score spectrum. These women are expected to show significant impairment.

To quantify the costs, available per cycle data on lost productivity and medical resource use were extracted from the dataset for each responder and unit costs were applied. These data were then extrapolated to estimate an annual expected cost. We conducted this analysis assuming a Brazilian perspective. The number of hours of lost productivity as reported in the m-WPAI data were multiplied by an hourly wage for Brazil to estimate the total cost of lost productivity per respondent per cycle and were extrapolated to estimate annual costs. Costs for respondents not in employment (and therefore reporting lost productivity relating to household chores) were calculated in the same manner, as the cost of their time is represented by the opportunity cost, which is to be in paid employment (following the human capital approach). We obtained a wage of 7.23 BRL per hour for female manual workers in the private sector [16].

Data related to reduced productivity (i.e., presenteeism) and affect on daily living activities were also analysed by DRSP category. Data were analysed according to the degree of affect on work or daily living activities reported in the m-WPAI. Responses were collapsed into two categories, moderate/severe affect, or mild/not relevant affect. To better understand the study findings, reported treatment use was also estimated and analysed according to country.

Results

Table 1 (Table 1 in Supplemental Materials found at doi:10.1016/j.jval.2011.05.008) shows expenditure on health by country using a number of indicators from the World Health Organization database [14]. Because our analysis relies on having a sufficient sample size to assess effects of disease severity by category, we chose to include all countries in the analysis despite some discrepancies in the similarity of their health expenditures (the implications of this are reviewed in the Discussion).

The analysis dataset comprised a total of 292 women classified as having moderate/severe PMS or PMDD. Data on quality of life were reported for a subset of these women and 63 women are included in the analysis of utility outcomes. Women were assigned to categories according to their DRSP total luteal symptom score.

Unit costs (Table 2 in Supplemental Materials at doi:10.1016/j.jval.2011.05.008) were applied to resource estimates to estimate costs. Mean per cycle values for lost productivity and medical resource use were calculated for each DRSP category and extrapolated to estimate the expected mean annual cost and utility influence as measured by QALY (Table 3 in Supplemental Materials found at: doi:10.1016/j.jval.2011.05.008). Confidence intervals (CIs) are reported to address the issue of uncertainty. The mean annual cost per woman with moderate/severe PMS or PMDD (independent of severity) was estimated at 1618 BRL (95% CI 957 BRL–2481 BRL).

The level of influence on work and daily living activities was estimated. Figure 1 (in Supplemental Materials found at doi:10.1016/j.jval.2011.05.008) shows the proportion of women who rated the burden of their condition on job activities as “not relevant/mild” or “moderate/severe” by DRSP category. Figure 2 (in Supplemental Materials at doi:10.1016/j.jval.2011.05.008) shows the proportion of women who rated the burden on daily living activities as “not relevant/mild” or “moderate/severe” by DRSP category.

The profile of individual country resource use was explored. Figure 3 (in Supplemental Materials found at: doi:10.1016/j.jval.2011.05.008) reports the percentage of women who reported treatment use across all resource categories.

Discussion and Implications

Categorical analysis of the observational data according to DRSP score found that work and daily activity impairment increased with DRSP severity. Our analysis of the data suggests a significant cost burden associated with moderate/severe PMS and PMDD although the relationship between severity and cost is not clear.

In this example, costs are estimated from a Brazilian societal perspective. Analysis of the individual country resource use data suggested differences in resource profiles. We would suggest that difference in resource use may in part be explained by the different distribution of disease severity across the individual country datasets (Figure 4 in Supplemental Materials found at: doi:10.1016/j.jval.2011.05.008). For example, Brazil has a much lower proportion of women in the lowest DRSP category (13% compared to 34%, 29%, and 22% for Colombia, Venezuela, and Mexico, respectively), whereas the Venezuelan and Mexican cohorts had proportionally smaller numbers of women in the highest DRSP category. This is in itself an interesting finding that may suggest a difference in perception of severity of symptoms across the Latin American countries included in the analysis. Further investigation of this is beyond the scope of the current article.

Analysis of the costs associated with medical resource use and lost productivity and the effects on quality of life did not show the expected relationship with disease severity. Our analysis showed a relationship between disease severity and measures of disease burden (e.g., job burden, activity burden, and number of treatments used). This analysis showed that, as expected, the proportion of women who experience burden on their activities/use of treatments increases with disease severity. However, results suggest that this did not translate into increasing costs associated with resource use and productivity loss. This is contrary to findings of previous analyses [15]. It is possible that the reason for this outcome is that women in Latin American countries are both less likely to present for costly treatment and less likely to be absent from work (despite severity of symptoms) then their Organisation for Economic Co-operation and Development counterparts. Presenteeism and affect on daily activities are reported consistently across the datasets and show a clear relationship with increasing severity as measured by DRSP score.

It would be interesting to explore the reasons for the lack of a stable relationship between more expensive resources used and DRSP category to more fully understand if region-specific difference in health care availability drives the differences between this and the Organisation for Economic Co-operation and Development analysis. Despite this, the estimated cost burden associated with women with moderate/severe PMD or PMDD was found to be high with the mean annual burden estimated in the region of 1500 BRL. Further quantification of the monetary effects of PMDD and research into potential geographical interactions is needed to better understand the burden of moderate to severe PMS and PMDD. The dataset reported here has a wide applicability and the approach described could be used to generate such evidence for other countries.

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Supplemental Materials

Supplemental material accompanying this article can be found in the online version as a hyperlink at doi:10.1016/j.jval.2011.05.008, or if hard copy of article, at www.valueinhealthjournal.com/issues (select volume, issue, and article).

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